From: Assistant Program Manager Engineering, PMA-202 Aircrew Systems, Naval Air Systems Command
To: APMEs and Class Desks, PMA-207, PMA-226, PMA-231, PMA-258, PMA-261, PMA-265, PMA-271, PMA-

273, PMA-274, PMA-275, PMA-276, PMA-290, PMA-299 and JSF, Naval Air Systems Command

Subj: GENERAL GUIDANCE AND BEST PRACTICES FOR PERSONAL PROTECTIVE EQUIPMENT AND AIRCRAFT DECONTAMINATION OF COVID-19.

Ref: (a) ATP 3-11.41/MCRP 3-37.2C/NTTP 3-11.24/AFTTP 3-2.37, Multi-Service TTP for CBRN Consequence Management Operations, July 2015.

- (b) S9086-QH-STM-010 NSTM Chapter 470, Shipboard BW/CW Defense and Countermeasures, Rev 06
- (c) NAVAIR 01-1A-509-1, TM 1-1500-344-23-1, TO 1-1-689-1, Technical Manual Cleaning and Corrosion Control, Volume 1, Corrosion Program and Corrosion Theory
- (d) NAVAIR 01-1A-509-2, TM 1-1500-344-23-2, Technical Manual Cleaning and Corrosion Control, Volume II Aircraft.
- (e) NAVAIR 00-80T-123 Aircrew Systems NATOPS Manual
- Encl: (1) DTG 252148Z MAR 20 PMA202 Guidance on Personal Protective Equipment (PPE) and/Management of PPE in support of COVID-19 Humanitarian Operations
 - (2) Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. Journal of Hospital Infection 104 (2020) 246-251.
 - (3) EPA's Registered Antimicrobial Products for Use Against Novel Coronavirus SARS-CoV-2, the Cause of COVID-19
- 1. PMA-202 Aircrew Systems has within their portfolio Personal Protective Equipment (PPE), Chemical Biological and Radiological (CBR) decontamination efforts. The recent crisis with COVID-19 has prompted many questions from the fleet on flight missions supporting the transportation of infected patients. Our efforts within this memorandum are to inform the USN and USMC aircraft PMA's with information and best practices for the use of PPE, and in drafting aircraft detailed decontamination procedures for their respective platforms. It is a summary of guidance provided by various agencies within DoD and the US Government, based on medical research.
- 2. Enclosure (1) is a recent Naval Message released to fleet commands on guidance use and management of PPE and alternative COTS items for aircrew and medical teams transporting infected patient supporting COVID-19 flight operations.
- 3. CBR doctrine, as described in refs (a) through (e), breaks aircraft decontamination down into two categories: hastv. and detailed.
 - a. The intent of hasty decontamination is to clean the commonly touched aircraft surfaces in order to minimize exposure for continued operations in a contaminated environment by personnel wearing CBR personal protective equipment (PPE).
 - Detailed decontamination is intended to return an aircraft to service for operations without the use of CBR PPE. It usually involves intensive maintenance for aircraft disassembly and decontamination of subcomponents.
- 4. The Center for Disease Control (CDC) has yet to provide specific guidance regarding how long COVID-19 can survive on exposed surfaces. Per Enclosure (2), coronaviruses can persist on inanimate surfaces like metal,

glass, or plastic for up to 9 days. More specifically, the Center for Disease Control (CDC) has reported finding RNA of SARS-CoV-2, the virus that causes coronavirus disease, on surfaces in cruise ship cabins of infected passengers up to 17 days after cabins were vacated

(https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e3.htm?s_cid=mm6912e3_w). However, research lead by the National Institute of Allergy and Infectious Diseases has found the viability of SARS-CoV-2 is greatly diminished after 72 hours (https://www.nejm.org/doi/full/10.1056/NEJMc2004973?query=featured home).

- 5. Coronaviruses can be efficiently inactivated by surface disinfection procedures with 62-71% ethanol, and various other solutions within 1 minute (Enclosure 2).
 - a. A list of Environmental Protection Agency (EPA) approved cleaning solutions known to kill the COVID-19 virus is provided in Enclosure (3).
 - PMA-202 makes no recommendation regarding a particular cleaning solution for aircraft decontamination as we cannot predict the corrosive effects of a particular solution on all material surfaces in each platform.
 - Special care must be taken to avoid corrosive effects on special coating that may be found on aircraft displays, windows, and HUDs. Some sensitive surfaces may require repeated wiping and rinsing cycles with anti-bacterial soap and water.
 - ii. The gasses from some solutions may be hazardous to personnel in confined spaces.
 - iii. Bleach solutions are known to degrade the integrity of fabrics used in seats, harnesses, and parachutes.
- 6. Recommended guidelines for hasty aircraft decontamination of COVID-19 include:
 - a. All personnel conducting decontamination should wear PPE appropriate for both COVID-19 and the cleaning solutions being used. The M-50 service respirator is recommended as it will provide the best protection for COVID-19. This recommendation is not meant to supersede command directed PPE based on references (a) through (d).
 - b. Sanitize all touch points in the aircraft and common surfaces.
 - c. Wipe down all air vents in the aircraft. Particular attention should be paid to oxygen mask connection fittings.
 - d. Wipe down walkways.
 - e. If the aircraft is down for maintenance or is not performing a quick turn. Recommend weathering the aircraft, open all doors and allow air to blow through the aircraft. Larger frame aircraft may need fans to assist, hot air is preferred. It is unknown as to whether the virus can be spread by being blown from a hard surface. Personnel should maintain a safe quarantine distance from the aircraft depending on the size of the space and whether fans are used.
- 7. Recommended guidelines for detailed aircraft decontamination of COVID-19 include:
 - a. If operational requirements permit, a quarantine of up to nine days may be required for a high level confidence. If operational requirements do not permit an extended quarantine, the quarantine period should be no less than three days.
 - b. Recommend weathering the aircraft, open all doors and allow air to blow through the aircraft. Larger frame aircraft may need fans to assist, hot air is preferred. It is unknown as to whether the virus can be spread by being blown from a hard surface. Personnel should maintain a safe quarantine distance from the aircraft depending on the size of the space and whether fans are used.
- 8. Points of contact for this memorandum are:

- Subj: GENERAL GUIDANCE AND BEST PRACTICES FOR PERSONAL PROTECTIVE EQUIPMENT AND AIRCRAFT DECONTAMINATION OF COVID-19.
 - a. PMA202 CBRN Capabilities Developer: Mr. William Strang, (301) 997-6402, william.strang@navy.mil, william.strang@navy.smil.mil
 - b. PMA-202 Military Class Desk: CDR Ian Kirschke, (301) 866-4423, email: ian.kirschke@navy.mil

c.

Eric Schwartz

PMA-202 Aircrew Systems APME

Subj: GENERAL GUIDANCE AND BEST PRACTICES FOR PERSONAL PROTECTIVE EQUIPMENT AND AIRCRAFT

DECONTAMINATION OF COVID-19.

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SUBJ/PMA202 UPDATED GUIDANCE ON PERSONAL PROTECTIVE EQUIPMENT (PPE) /AND MANAGEMENT

OF PPE IN SUPPORT OF COVID-19 HUMANITARIAN OPERATIONS //

REF/A/GENADMIN/COMNAVAIRSYSCOM PATUXENT RIVER MD/-/252148ZMAR2020//

REF/B/NAVADMIN/064-20/-/122210ZMAR2020//

REF/C/PUBLICATION/NAVAIR 00-80T-123/-/01MAY2019//

REF/D/PUBLICATION/NAVAIR 13-1-6.10/-/15SEP1999//

REF/E/PUBLICATION/NAVAIR 13-1-6.10.3/-/28SEP2018//

REF/F/DOCUMENT/PMA202 MEMORANDUM/-/23MAR2020//

REF/G/MANUAL/NTTP 3-11.24/-/01APR2008//

REF/H/MANUAL/NSTM S9086-QH-STN-010/-/30AUG2018//

NARR/REF (A) IS A GENERAL ADMINISTRATIVE MESSAGE FROM COMNARAIRSYSCOM PMA202 PROVIDING INITIAL GUIDANCE TO THE FLEET ON AIRCREW PPE AND MANAGEMENT OF PPE ISO COVID-19 HUMANITARIAN OPERATIONS REF (B) IS A NAVAL ADMINISTRATIVE MESSAGE FOR NAVY MITIGATION MEASURES IN RESPONSE TO CORONAVIRUS OUTBREAK DTG 122210Z MARCH 2020. REF (C) IS AIRCREW SYSTEMS NATOPS MANUAL DTD 01 MAY 2019. REF (D) IS TECHNICAL MANUAL AVIATION-CREW SYSTEMS SPECIAL MISSION AIRCREW EQUIPMENT CHANGE 18 DTD 28 FEBRUARY 2020. REF (E) IS OPERATOR AND FIELD MAINTENANCE MANUAL FOR MASK, CHEMICAL-BIOLOGICAL: JOINT SERVICE AIRCREW MASK, MPU-5(V)/P REF (F) IS A NO TECHNICAL OBJECTION MEMORANDUM FOR THE RECORD FROM THE PMA202 CHIEF ENGINEER TO THE PMA202 AIRCREW SYSTEMS IN-SERVICE SUPPORT CENTER MILITARY LEAD WITH SUBJECT NO TECHNICAL OBJECTION MEMORANDUM FOR PERSONAL PROTECTIVE EQUIPMENT IN SUPPORT OF COVID-19 FLIGHT OPERATIONS DTD 23 MARCH 2020. REF (G) IS A MULTISERVICE MANUAL FM 3-11.21 MCRP3-37.2C NTTP 3-11.24 AFTTP(I) 3-2.37 MULTISERVICE TACTICS, TECHNIQUES, AND PROCEDURES FOR CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR CONSEQUENCE MANAGEMENT OPERATIONS DTD 01 APRIL 2008. REF (H) IS THE NAVAL SHIPS

TECHNICAL MANUAL, CHAPTER 470 SHIPBOARD BW/CW DEFENSE AND COUNTERMEASURES REVISION 6.// POC/SEAN MCCARTHY/CDR/UNIT:PMA202/NAME:PATUXENT RIVER MD /TEL:301-866-2069/EMAIL:SEAN.M.MCCARTHY3@NAVY.MIL//

GENTEXT/REMARKS/1. THE PURPOSE OF THIS MESSAGE IS TO UPDATE GUIDANCE FOR AIRCREW PERSONNEL PROTECTIVE EQUIPMENT (PPE) IN SUPPORT OF NOVEL CORONAVIRUS DISEASE 2019 (COVID-19) RELATED FLIGHT OPERATIONS. THIS MESSAGE SUPERSEDES REF (A). TECHNICAL UPDATES ARE FOUND IN PARAGRAPHS 6, 8, 11, 12, 13, AND 14.

- 2. PMA202 AIRCREW SYSTEMS TESTS, QUALIFIES, AND SUSTAINS MOST OF THE AVIATION LIFE SUPPORT SYSTEMS (ALSS) UTILIZED BY NAVAL AIRCREW TO INCLUDE SPECIALIZED PPE FOR SPECIFIC OPERATIONAL ENVIRONMENTS.
- 3. IN ACCORDANCE WITH REF (B), THE NAVY RECOGNIZES THE UNITED STATES PUBLIC HEALTH SERVICE (USPHS) CENTERS FOR DISEASE CONTROL (CDC) AS THE LEAD FOR GUIDANCE ON THE CHARACTERISTICS OF THE VIRUS. THE CDC HAS DEFINED COVID-19 AS A HIGHLY CONTAGIOUS RESPIRATORY VIRUS THAT CAN BE TRANSMITTED VIA HUMAN-TO-HUMAN CONTACT WITHIN SIX FEET ENTERING THROUGH THE MOUTH, NOSE, OR EYES. THE CDC ALSO STATES THAT COVID-19 MAY BE TRANSMITTED FROM SURFACE TO HUMAN CONTACT IF A PERSON TOUCHES A CONTAMINATED SURFACE AND THEN TOUCHES THEIR MOUTH, NOSE, OR EYES.
- 4. THE MOST EFFECTIVE FLIGHT APPROVED PPE THAT PROTECTS THE MOUTH, NOSE, AND EYES FROM THE COVID-19 ARE THE LEGACY A/P22P-14 SERIES CBR RESPIRATOR AND THE NEW JOINT SERVICES AIRCREW MASK (JSAM) MPU-5 SERIES WHEN USED IAW REFS (C), (D), AND (E). THESE ALSS PRODUCTS REQUIRE SIZING, FITTING, AND TRAINING FOR BOTH AIRCREW AND MAINTAINERS TO MAXIMIZE EFFECTIVENESS. PMA202 FLEET SUPPORT TEAMS ARE AVAILABLE UPON REQUEST THROUGH TYCOMS.

 5. PMA202 HAS REVIEWED THE FOLLOWING ITEMS REQUESTED FOR USE BY CNAF AS ALTERNATIVE PPE AND HAS NO TECHNICAL OBJECTION TO THEIR USE IN FLIGHT AS NOTED IN REF (F). THE CDC PROVIDES GUIDANCE AS TO THE EFFECTIVENESS OF THESE ITEMS (HTTPS:(DOUBLE SLASH)WWW.CDC.GOV/CORONAVIRUS/2019-NCOV/HCP/INDEX.HTML).

A. NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) CERTIFIED N95 RESPIRATOR. B. SURGICAL MASK OR FACEMASK.

THESE ITEMS HAVE THE FOLLOWING RESTRICTION.

THE N95 RESPIRATOR AND SURGICAL MASK SHALL BE REMOVED TO ALLOW THE USE OF EMERGENCY OXYGEN AND AIR SYSTEMS IF REQUIRED.

THESE ITEMS HAVE THE FOLLOWING CAUTIONS.

THE N95 RESPIRATOR AND SURGICAL MASK REQUIRE PROPER SIZING AND FITTING FOLLOWING MANUFACTURERS INSTRUCTIONS PRIOR TO OPERATIONAL USE. THE USE OF THE N95 RESPIRATOR AND SURGICAL MASK MAY REDUCE SPEECH INTELLIGIBILITY OVER COMMUNICATION SYSTEMS. THE USE OF THE APPROVED MAXILLOFACIAL SHIELD WITH THE SURGICAL MASKS MAY IMPROVE INTELLIGIBILITY. C. POWDER FREE NITRILE GLOVES:

THIS ITEM HAS THE FOLLOWING RESTRICTION.

IF WORN, NITRILE GLOVES SHALL BE WORN UNDER STANDARD FLYERS GLOVE, AND SHALL NOT BE WORN WITH FINGERLESS FLIGHT GLOVES.

THIS ITEM HAS THE FOLLOWING WARNING.

THE MATERIAL OF THE GLOVES MAY MELT ONTO THE SKIN IF EXPOSED TO HIGH HEAT.

6. PMA202 HAS REVIEWED THE FOLLOWING ITEMS REQUESTED FOR USE BY CNAF AS ALTERNATIVE PPE FOR SAR MED TECHS AND MEDICAL PROVIDERS SERVING AS SPECIAL AIRCREW AND HAS NO TECHNICAL OBJECTION TO THEIR USE IN FLIGHT AS NOTED IN REF (E). THE CDC PROVIDES GUIDANCE AS TO THE EFFECTIVENESS OF THESE ITEMS (HTTPS:(DOUBLE SLASH)WWW.CDC.GOV/CORONAVIRUS/2019-NCOV/HCP/INDEX.HTML).

A. TYVEK COVERALL

B. TYVEK BOOTIES

C. DISPOSABLE COVERALL (NSN 8415-00-601-0801) D. DISPOSABLE COVERALL (NIIN 8415-01-445-6568) THESE ITEMS HAVE THE FOLLOWING RESTRICTION. SHALL NOT BE WORN WITH ANTI-EXPOSURE SUITS. THESE ITEMS HAVE THE FOLLOWING WARNINGS.

THE MATERIAL USED FOR TYVEK SUITS, TYVEK BOOTIES, AND DISPOSABLE COVERALLS IS NOT FLAME RESISTANT. PERSONNEL SHALL ALWAYS WEAR FLAME RESISTANT CLOTHING BENEATH THESE ITEMS. THESE MATERIALS RETAIN BODY HEAT AND HIGH ENVIRONMENTAL TEMPERATURES AND HIGH WORK RATES MAY INCREASE THE RISK OF HEAT INJURY. PERSONNEL SHALL ENSURE PROPER HYDRATION IN ALL ENVIRONMENTAL CONDITIONS. THE TYVEK BOOTIE MAY REDUCE FOOT TRACTION ON SURFACES AND COULD RESULT IN SLIPS OR FALLS.

- 7. REF (C) PROVIDES A LISTING OF APPROVED EYE PROTECTION FOR AIRCREW.
- 8. UPON COMPLETION OF FLIGHTS WITH SUSPECTED EXPOSURE TO COVID-19, PASSENGERS, PATIENTS, AND AIRCREW SHOULD PROCEED THROUGH LOCAL COMMANDS DECONTAMINATION PROCESS TO REDUCE THE RISK OF INFECTION. SQUADRON FLIGHT EQUIPMENT PERSONNEL SHOULD ASSIST SHIPBOARD OR GROUND CHEMICAL, BIOLOGICAL, RADIOLOGICAL SPECIALISTS WITH THE REMOVAL OF AIRCREW PPE AND ALSS IN ACCORDANCE WITH PROCEDURES IN REFS (C), (D), (E), (G), AND (H). USED N95 RESPIRATORS OR SURGICAL MASKS SHOULD BE DISPOSED OF AS BIOLOGICAL WASTE. AIRCREW WILL NEED ASSISTANCE IN REMOVAL OF A/P22P-14 SERIES OR JSAM MPU-5 SERIES CBR RESPIRATOR. THESE MAY BE REUSED IAW PROCEDURES BELOW. IF TEXTILE ALSS COMES INTO CONTACT WITH BODILY FLUIDS OF AN INFECTED PATIENT IT SHOULD BE DISPOSED OF AS A BIOLOGICAL HAZARD. 9. FLIGHT EQUIPMENT PERSONNEL SHOULD ENSURE ALSS, WITH THE EXCEPTION OF FLIGHT SUITS, ARE PAIRED WITH SPECIFIC AIRCREW, LABELED, AND TRANSPORTED AS CONTAMINATED ITEMS TO A DEFINED QUARANTINE AREA FOR STORAGE UNTIL SUBSEQUENT USE. A COMMON QUARANTINE AREA CAN BE USED FOR MULTIPLE AIRCREWS EQUIPMENT, HOWEVER, INDIVIDUALS EQUIPMENT SHOULD NOT COME IN CONTACT WITH OTHER INDIVIDUALS EQUIPMENT.
- 10. AIRCREW SHOULD REMOVE THEIR FLIGHT SUIT AND BAG THESE ITEMS FOR SEGREGATED LAUNDERING IN FULL WASH AND MACHINE HEAT DRY.
- 11. ALL ALSS PLACED IN QUARANTINE SHOULD NOT BE SHARED. IF THIS ALSS IS SUBSEQUENTLY USED FOR MISSIONS NOT RELATED TO COVID-19, THEN IT IS RECOMMENDED THAT ALL CREW MEMBERS USE MOUTH, NOSE, AND EYE PPE AS THE AFFECT OF AIR CURRENTS CAUSING THE VIRUS TO BECOME AIRBORNE FROM SURFACES IS NOT CLEAR.
- 12. THE FOLLOWING PROCEDURES CAN REDUCE THE CONTAMINATION LEVELS OF ALSS. FLIGHT EQUIPMENT PERSONNEL SHOULD DON APPROPRIATE PPE BEFORE FOLLOWING THESE PROCEDURES. THE RECOMMENDED SOLUTION IS ISOPROPYL ALCOHOL BUT A DILUTED BLEACH SOLUTION (FIVE TABLESPOONS BLEACH PER ONE GALLON WATER) CAN BE USED IF ISOPROPYL ALCOHOL IS UNAVAILABLE. THE PARALOFT SHALL OPEN A LOGBOOK TO TRACK THESE EVENTS FOR FUTURE DISPOSITION OF THE ALSS BASED ON PMA202 LABORATORY FINDINGS.

NOTE: ISOPROPYL ALCOHOL SPRAYED ON CLOTH MAY BE USED TO CLEAN AN NVS-9 AND AN NVS-11 NVDS, EXCLUDING THE OPTICS. THE OPTICS SHALL ONLY BE CLEANED USING THE TECHNICAL PUBLICATION PROCEDURES

- A. FILL A MISTING SPRAY BOTTLE WITH A 70% ISOPROPYL ALCOHOL SOLUTION OR BLEACH SOLUTION.
 B. PLACING THE SPRAY BOTTLE APPROXIMATELY 6 INCHES AWAY FROM THE ALSS ITEM, SPRAY THE ALSS ITEM AND ALLOW CONTACT TIME OF 30 SECONDS.
- C. WIPE DOWN THE ITEMS WITH A DRY CLOTH AND SET OR HANG ITEMS TO DRY.
- D. IN THE LOGBOOK, RECORD DATE, AIRCREW NAME, ALSS ITEM, TYPE OF SOLUTION USED (ISOPROPYL ALCOHOL OR BLEACH), DRYING LOCATION (SUNLIGHT, ARTIFICIAL LIGHT, OR DARK) AND APPROXIMATE, DELIBERATE UV EXPOSURE TIME.

13. QUARANTINED ALSS SHOULD BE TREATED AS CONTAMINATED. ENSURE THE QUARANTINE AREA IS IN A LOCATION IAW REF (G) AND (H). DEPENDING ON WHERE THE QUARANTINE AREA IS LOCATED, ALSS MAY NEED TO BE TRANSPORTED AS CONTAMINATED ITEMS TO AN APPROPRIATE DONNING AREA IAW ESTABLISHED PROCEDURES. THE CDC DOES NOT HAVE DEFINITIVE GUIDANCE ON HOW LONG THE VIRUS REMAINS VIABLE, HOWEVER THEIR CURRENT INFORMATION SHOWS A SIGNIFICANT DECREASE IN VIABILITY AFTER 72 HOURS (HTTPS:(DOUBLE

SLASH)WWW.NEJM.ORG/DOI/FULL/10.1056/NEJMC2004973). EXPOSURE TO UV LIGHT, SUCH AS NATURAL SUNLIGHT, INCREASES THE CHANCE OF KILLING THE VIRUS.

14. THE LONG TERM EFFECTS OF ISOPROPYL ALCOHOL AND BLEACH ON ALSS MATERIALS IS UNKNOWN. PMA202 WILL RELEASE FURTHER GUIDANCE WITHIN 90 DAYS CONCERNING LONG TERM MANAGEMENT OF EXPOSED ALSS. UNTIL THEN, ALSS CAN BE CONSIDERED RFI AS IT RELATES TO MATTERS IN THIS MESSAGE.

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Enclosure (2):



Enclosure (3):